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Oil Transport From the Persian Gulf: An Energy Security Issue

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An Intelligence Assessment

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GI 83-10079
April 1983
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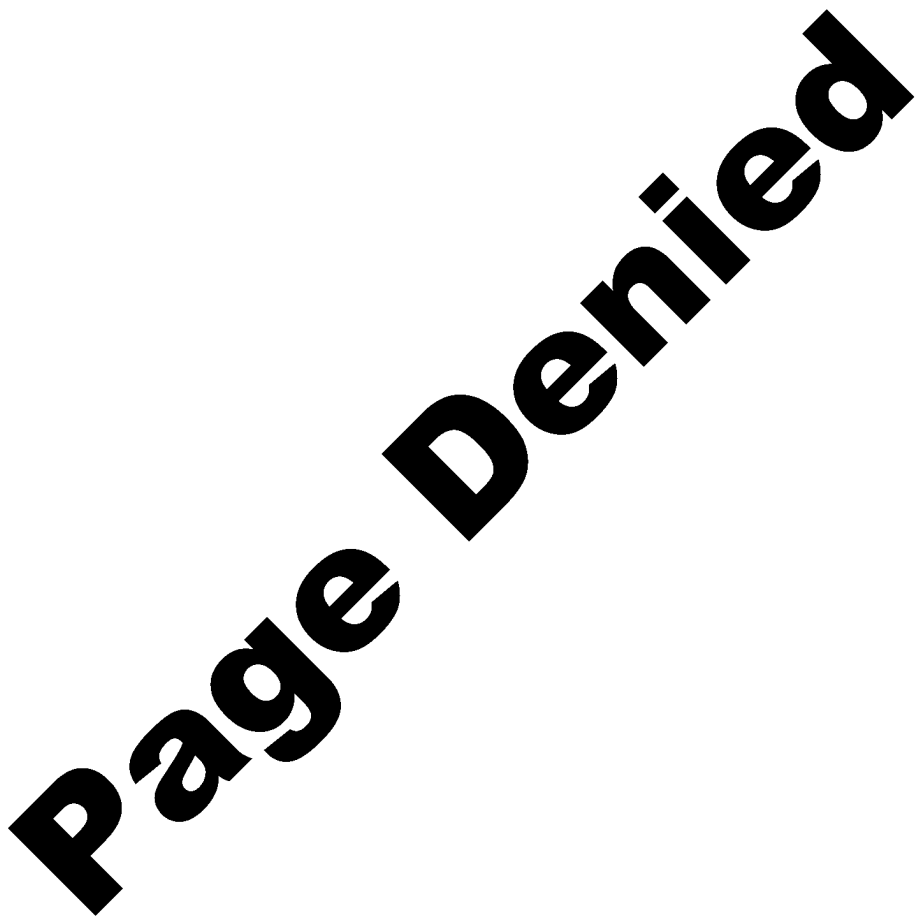

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An Intelligence Assessment

This assessment was prepared by of the Office of Global Issues. Comments and queries are welcome and may be directed to the Chief, Energy Issues Branch, OGI,

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Oil Transport From the Persian Gulf: An Energy Security Issue

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Key Judgments

Information available as of 15 March 1983 was used in this report.

The degree to which the non-Communist countries depend on Persian Gulf oil and the uncertain political climate in the Middle East continue to underscore the potential for a major disruption of non-Communist oil supplies:

- The Persian Gulf currently supplies about a fourth of non-Communist oil needs. This share is likely to grow because of the large reserves in the region.
- Although US dependence on Persian Gulf oil has dropped to less than 20 percent of total oil imports, other OECD countries still rely on the region for over 40 percent and Japan for 60 percent of total oil imports.

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While the present combination of surplus productive capacity, excess stocks, and declining consumption provides considerable protection in the near term, this cushion is likely to shrink in the years ahead, and the market will become more vulnerable to supply disruptions. Industry forecasts indicate that by 1990 the Persian Gulf will still contribute 10 to 11 million barrels per day (b/d) of exports to the non-Communist countries' oil supply. A number of elements cause concern for the reliability of Persian Gulf oil supplies, including the concentration of highly vulnerable oil facilities, the need for most Persian Gulf oil to transit the Strait of Hormuz at the southern end of the Gulf, and political instability in the region. At any time, the economic and political fallout from a major disruption—involving Saudi Arabia or the entire Persian Gulf region—would be severe.

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Because of the vulnerability of the Strait of Hormuz, Gulf states have wanted additional pipelines that bypass the strait. In 1981 Saudi Arabia completed a 1.85-million-b/d pipeline to the Red Sea that bypasses the strait, bringing the region's total pipeline export capacity to about 4 million b/d. The most ambitious proposal is for a 1-million-b/d pipeline linking the oilfields of Kuwait, Saudi Arabia, Qatar, and the United Arab Emirates to an export facility on the coast of Oman. Iraq, which has lost its capability to export oil through the Persian Gulf since its conflict with Iran began, is pushing for a new pipeline crossing Saudi Arabia to the Red Sea. Iraq also is expanding the capacity of its 700,000-b/d export pipeline through Turkey.

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Table 1
Non-Communist Dependence on Persian Gulf Oil [a]

Thousand barrels per day
(except where noted)

	1982 [b]			1978			1973		
	Persian Gulf	Total Imports	Percent	Persian Gulf	Total Imports	Percent	Persian Gulf	Total Imports	Percent
United States	842	4,782	18	2,602	8,364	31	1,380	6,256	22
Japan	2,708	4,625	59	3,853	5,347	72	4,100	5,576	74
Western Europe	4,078	13,120	31	8,455	13,128	64	10,807	16,714	65
Of which:									
France	924	2,033	45	1,749	2,494	70	1,893	2,875	66
Italy	802	2,040	39	1,437	2,362	61	1,739	2,669	65
United Kingdom	357	964	37	966	1,596	61	1,793	2,749	65
West Germany	446	2,217	20	886	2,848	31	1,307	3,001	44

[a] Includes imports of crude oil and refined products, including natural gas liquids.
[b] First half of 1982.

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economic reasons in 1975. In recent years the line has been used only to supply refineries in Jordan and Lebanon, and shipments have averaged less than 100,000 b/d. cannibalization of pumps and equipment has probably cut Tapline's effective capacity in half. Fighting in Lebanon also damaged both the line and the export terminal and refinery at Sidon. Tapline recently announced its intention to abandon the Lebanese portion of the line, which has not been used since 1981.

Petroline, also called the East-West Pipeline, opened in July 1981, connecting the Ghawar Oilfield at Abqaiq to the Red Sea port of Yanbu al Bahr, 1,200 km away. The pipeline was built primarily to enhance Saudi export flexibility by providing an outlet to bypass the Strait of Hormuz, as well as to supply three new refineries on the west coast. The line's design capacity is 1.85 million b/d, but a surcharge of $0.50 per barrel is making customers reluctant to lift oil at Yanbu al Bahr. Throughput in 1982 averaged only about 1.1 million b/d and so far this year has averaged less than half that. A 270,000 b/d NGL pipeline parallels the crude oil line, providing fuel for the pumping stations and feedstock to a 250,000 b/d NGL fractionation plant in Yanbu al Bahr.

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The Iraqi Pipelines. The Iraq-Syria-Lebanon Pipeline is the oldest export pipeline in the Middle East. First opened in 1934, the original line was laid from the Kirkuk Oilfield in Iraq through Syria to the Lebanese port of Tripoli. Since then, three parallel pipelines have been constructed, and a northern spur to the Syrian port of Baniyas has been added. Total throughput capacity for the system is 1.2 million b/d. In recent years, operation of the line has been interrupted by political differences between Baghdad and Damascus and by unrest in Lebanon. A dispute over transit fees closed the pipeline from 1976 to 1979, and in April 1982 Syria shut the line in a show of support for Iran. Sporadic incidents of sabotage occurred during periods the pipeline was in use, although the damage never seriously affected operations. Before its closure in 1982, the Iraq-Syrian-Lebanon Pipeline system carried up to about 700,000 b/d.

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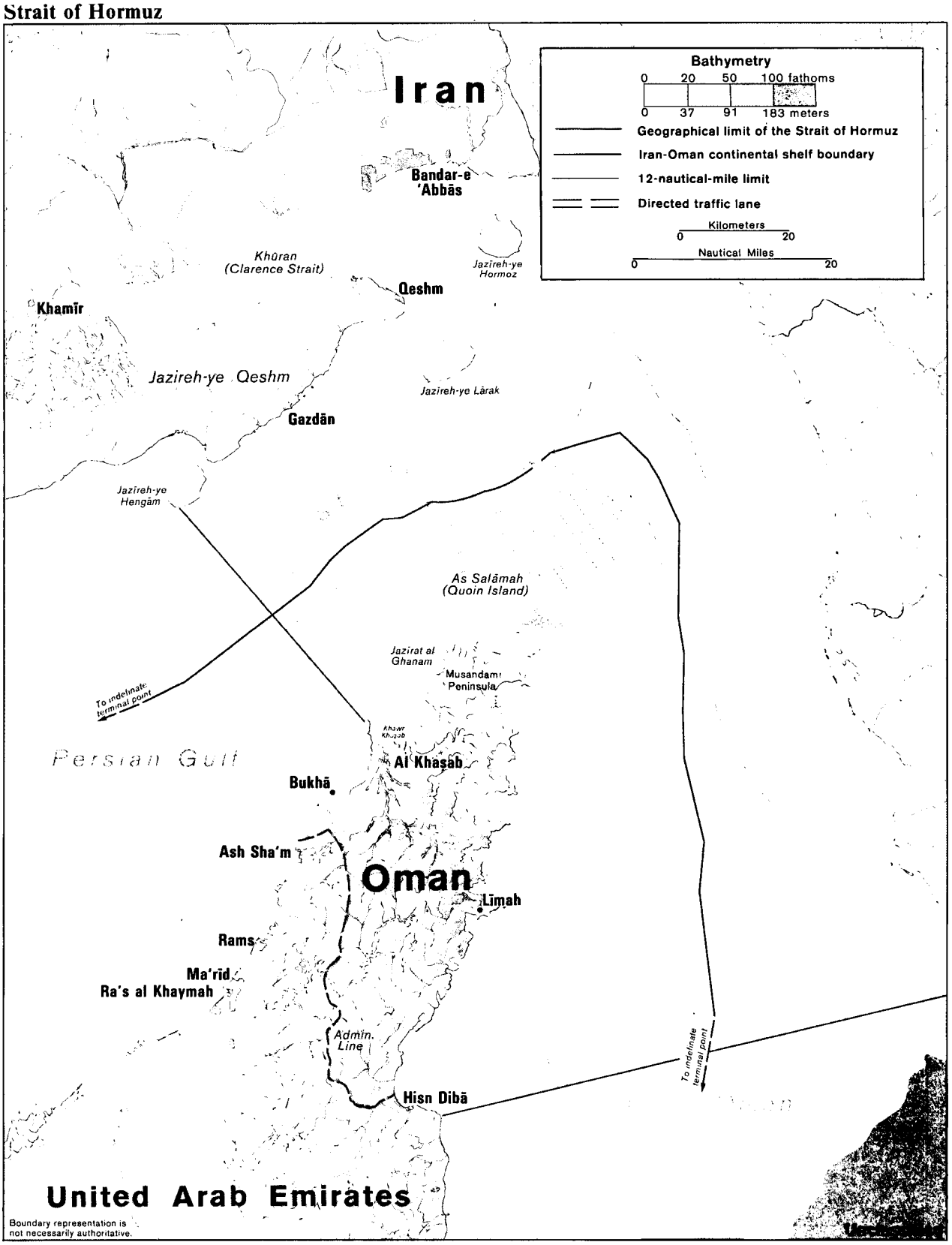
Strait of Hormuz



Middle East: Major Oil Pipelines

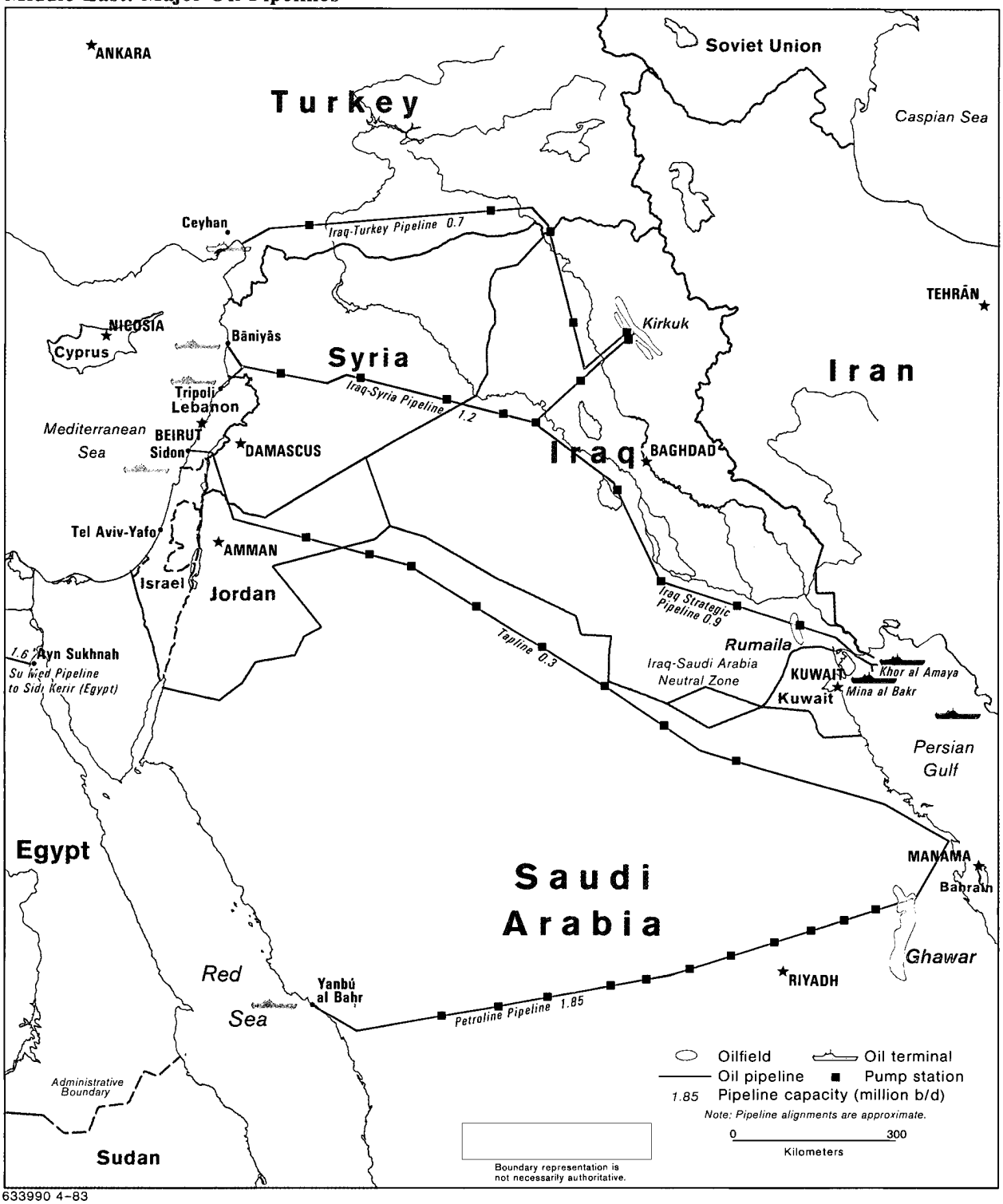


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Table 2
Persian Gulf Oil Export Pipelines

Million barrels per day

	Nominal Capacity	Current Capacity		Capacity in 1990	
		Effective Capacity	Average 1982 Volumes	Low Estimate	High Estimate
Existing pipelines					
Iraq-Syria-Lebanon	1.2	1.05 [a]	0.1 [b]	1.2	1.2
Iraq-Turkey	0.7	0.7c	0.65	0.98	0.98
Tapline	0.5	0.25	0.05 [d]	0.1	0.5
Petroline	1.85	1.85	1.1	1.65 [e]	3.5
Total	**4.25**	**3.85**	**1.90**	**3.93**	**6.18**
Proposed pipelines					
Iraq–Saudi Arabia				0	1.6
Persian Gulf–Oman				0	1.0
Total				**0**	**2.6**
Total throughput capacity in 1990				**3.93**	**8.78**

[a] Estimated, on the basis of possible export capacity restrictions at the port of Baniyas.
[b] Represents the average for the full year; the pipeline was actually shut down in April.
[c] Capacity currently being expanded by 280,000 b/d.
[d] Tapline only exported to Jordan in 1982.
[e] Export capacity; figure excludes an estimated 200,000 b/d for the Yanbu al Bahr domestic refinery, which will provide products for Saudi internal consumption.

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The effective export capacity of the Iraq-Syria-Lebanon Pipeline may currently be limited by its two tanker loading terminals. The nominal export capacity of the port of Baniyas is 830,000 b/d; reconfiguration of berths in 1976-77 to enable Syria to import refined petroleum products reduced this to an estimated 400,000 b/d, and it is unclear if this port constraint has been lifted. Before the closure of the pipeline last year, Iraqi exports through Baniyas between 1979 and 1982 never exceeded 400,000 b/d.

The port at Tripoli has the capacity to export about 650,000 b/d and is capable of handling tankers up to 300,000 deadweight tons (dwt), more than twice the size that can be berthed at Baniyas. Even if Syria were to open the main pipeline, however, unsettled conditions in Lebanon could continue to keep the Tripoli spur closed.

The Iraq-Turkey Pipeline, running from the Kirkuk Oilfield in northern Iraq to a Mediterranean loading facility near Ceyhan, Turkey, is currently Baghdad's sole export route. The six-year-old pipeline is capable of carrying 700,000 b/d, and it has been running at about this level since the Syrian Pipeline was closed. Periodic sabotage attacks have closed the line several times since the Iran-Iraq war began, but the flow of oil has not been stopped for long, and it does not appear that the damage has affected pipeline capacity.

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Iraq's internal "North-South" Pipeline is also a major link in the country's export system. The pipeline links the Iraq-Syria-Lebanon line at Al Hadithah in western Iraq to the southern oilfields near Al Basrah, and

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Table 3
Major Middle East Crude Oil Pipelines as of 1 January 1983

	Point of Origin	Export Terminal	Capacity *(million b/d)*	Diameter *(inches)*	Length *(km)*	Number of Pump Stations	Date Opened	Export Terminal Capacity *(thousand b/d)*	Storage Capacity *(million bbl)*	Maximum Tanker Size *(thousand dwt)*	Remarks
The Iraqi system											
Iraq-Syria-Lebanon	Kirkuk Oilfield, Iraq	Tripoli, Lebanon	0.05	12	856	7	1934	645	1.4	300	Original Middle East long-distance pipeline.
	Kirkuk	Tripoli	0.10	16	856		1949				Parallels 12-inch line; utilizes same pump stations and export facilities.
	Kirkuk	Baniyas, Syria	0.35	30-32	891		1952	830	5.6	120	Parallels 12- and 16-inch lines for 795 km, utilizing their pump stations.
	Kirkuk	Baniyas	0.70	30-32	891		1961				"Loops" on original 32-inch line connected to form second 32-inch pipeline, raising total system capacity to 1.2 million b/d. A 30-inch spur to Tripoli was constructed alongside the 12- and 16-inch pipelines.
Iraq-Turkey (BOTAS)	Kirkuk, Iraq	Ceyhan, Turkey	0.70	40	981	5	1977	1,000 (minimum)	7.0	300	Pipeline capacity being expanded by 280,000 b/d by mid-1984.
Iraq Strategic Pipeline	Al Hadithah, Iraq	Rumaila, Iraq	0.98 (south) 0.88 (north)	42	655	3	1976				Connects Iraq's northern and southern oilfields; crude oil can be pumped in either direction.
The Saudi system											
Trans-Arabian Pipeline (Tapline)	Qaisumah, Saudi Arabia	Sidon, Lebanon	0.50	30-31	1,213	8	1950	500 (minimum)	4.1	150	Lebanese section closed and possibly will be abandoned; pipeline is open to Jordan, supplying about 50,000 b/d. Tapline's effective capacity may be only about 250,000 b/d.
Petroline	Abqaiq, Saudi Arabia	Yanbu al Bahr, Saudi Arabia	1.85	48	1,202	11	1981	3,700 (minimum)	11.0	500	1982 throughput approximately 1.1 million b/d.
Egypt											
Suez-Mediterranean (SuMed)	Ain Sukhna, Egypt	Sidi Kerir, Egypt	1.60	2 by 42	320	2	1977	1,700 (estimated)	7.5 (both terminals)	285 (both terminals)	Connects Red and Mediterranean Seas, bypassing Suez Canal; minor modifications could increase capacity to 1.9 million b/d.

it is capable of pumping oil in either direction. The line's capacity is 980,000 b/d pumping south, and 880,000 b/d north. Until April 1982, crude oil from Iraq's southern oilfields was being fed into the Syrian pipeline system for export through Baniyas and Tripoli.

Egypt's SuMed Pipeline. Egypt's 1.6 million b/d pipeline from the Gulf of Suez to the Mediterranean (the SuMed Pipeline) facilitates the movement of Persian Gulf oil from the Red Sea to southern Europe. The pipeline cuts approximately 13,000 km off the alternate route around the Cape of Good Hope and reduces costs by allowing the movement of oil to and from Egypt in ultralarge crude carriers that cannot transit the Suez Canal. In 1981 and 1982 the SuMed Pipeline operated slightly above capacity, although early projections for 1983 indicate that throughput may be only about 1 million b/d this year. Despite this, Egypt is apparently proceeding with plans to place an additional loading buoy at each end of the SuMed Pipeline to increase capacity by about 300,000 b/d this year.

Expansion of Middle East Pipelines

The vulnerability of the Strait of Hormuz has led Persian Gulf oil producers to consider ways to increase their export flexibility. The closure of Iraqi export terminals in the Gulf because of war damage in the fall of 1980 and the threat posed by Iran to exports from the rest of the Gulf added urgency to these efforts. With the recent softening of the oil market, however, much of the momentum behind new projects is quickly being eroded.

Capacity Increases in Existing Lines. While most existing pipelines have been considered for expansion since 1979, work has begun only on the Iraqi line through Turkey. Baghdad has signed contracts with a West German firm to supply pumps for five new pumping stations, and with a Turkish company for construction of new pipeline segments. Three of the stations are to be located in Turkey, and two in Iraq. In addition to new stations, existing pumps will be replaced and the construction of 75 km of parallel pipeline will enhance flow in uphill sections, increasing the pipeline's present 700,000 b/d capacity by about 280,000 b/d. The expansion is scheduled to be completed by mid-1984 at an estimated cost of $100-140 million financed entirely by Iraq. 25X1

Preliminary feasibility studies to expand other Middle East pipelines have also been conducted. These studies conclude: 25X1

- By adding pumps at existing stations, Iraq could increase the capacity of the Syrian pipeline by 200,000 b/d. Political differences between Baghdad and Damascus make this action unlikely even if Syria does reopen the line.

- Addition of a pump station could increase the capacity of Saudi Arabia's Petroline by 500,000 b/d within two years. Construction of a parallel pipeline would double capacity to 3.7 million b/d but would take at least four years to complete. 25X1

- Addition of another pump station to Egypt's SuMed Pipeline could increase throughput to 2.1 to 2.3 million b/d. 25X1

Construction of New Pipelines

Several new pipelines are now under consideration. An Iraqi line across Saudi Arabia, which has recently been approved by Riyadh, appears the most likely to be undertaken. A feasibility study completed in 1981 examined a proposal for a 1.6 million b/d pipeline costing an estimated $3.6 billion. Of several alternate routes contemplated, the most favorable would run west of Kuwait and join Petroline in western Saudi Arabia. The pipeline would then follow Petroline's right-of-way over the mountains to the Red Sea. To avoid overcrowding at Yanbu al Bahr, a new export terminal would be constructed about 25 km south of the city. Construction could be delayed by cash-flow problems in Iraq. 25X1 25X1

Other pipeline projects have been proposed within the Gulf Cooperation Council (GCC), which includes Saudi Arabia, Kuwait, Qatar, the UAE, Bahrain, and Oman. The most ambitious would link Kuwait, Saudi

Middle East: Proposed Crude Oil Pipelines

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Arabia, Qatar, and the UAE to the southern coast of Oman by way of a 1-million-b/d pipeline. Iraq has expressed an interest in tying into this system with a 1-million-b/d pipeline to Kuwait, but according to various embassy reports there is little enthusiasm within the GCC for this proposal.

Construction of pipelines to export terminals on the Arabian Sea have also been proposed in Saudi Arabia and the UAE. The Saudi line has been considered several times in the past decade, most often in conjunction with development of the Shaybah Oilfield in southeastern Saudi Arabia. While development of this field could make a line across Oman economically attractive some time in the future, the sharp decline in demand for Saudi oil has made such an undertaking unlikely at least over the next several years.

In 1981 the UAE studied a 1.6-million-b/d pipeline from Abu Dhabi to the Gulf of Oman that would remain entirely within the Emirates, but no serious consideration has been given to the actual construction of such a line.

Until recently, Iran had considered constructing an oil pipeline across Turkey to the Black Sea. The possibility was raised last year in connection with a proposed natural gas pipeline running through Turkey to Western Europe. The scheme for the gas pipeline was originally proposed by the Shah in the late 1960s, but it was shelved until recently. Renewed European interest in natural gas prompted a second look at the project, but according to press reporting the proposal has been shelved because neither pipeline is now considered economically viable.

Prospects for the Future

If past trends are any indication, few if any of the newly considered projects will be completed. With oil revenues plummeting, Gulf producers are reluctant to allocate funds to construct new oil pipelines across Saudi Arabia or Oman. Even expansion programs are becoming costly. The US Embassy in Jidda reports that raising the capacity of Saudi Arabia's Petroline by 500,000 b/d would cost an estimated $1 billion, while the original price for the pipeline was only $1.6 billion. Despite recent discussions within the GCC, a pipeline to Oman appears no closer to serious consideration now than in the past. Construction would be expensive, and, with a capacity of only 1 million b/d, the added flexibility provided would be marginal. 25X1 25X1

The project most likely to proceed is the Iraq–Saudi Arabia Pipeline. According to Embassy reporting, the urgency with which Baghdad views the construction of the line was evident in recent talks with Riyadh, when King Fahd finally gave his consent to go ahead with the project. Given current cash-flow problems for both countries, however, it is doubtful whether the nearly $4 billion needed will be forthcoming. In addition, since construction alone is estimated to take four to five years, the line probably could not operate before 1987, even if started this year. 25X1 25X1

Implications for the United States

By the end of the decade, the West will still require some 10 to 11 million b/d of oil from the Persian Gulf. While US imports from the region are likely to remain at a low level, continued dependence of US allies on Gulf oil will link US interests with the free flow of oil from the region. An interruption in Persian Gulf supplies would result in a tighter market for foreign oil, higher oil prices, and possible enactment of the IEA's emergency oil-sharing plan. 25X1 25X1

With the capacity of oil export pipelines from the Persian Gulf not likely to undergo a major expansion by the end of the decade, the vulnerability of Persian Gulf oil to disruption probably will not be significantly moderated. We believe that by 1990 the capacity of export pipelines from the Persian Gulf will not be much greater than 4 million b/d. The non-Communist world, therefore, will continue to ship a minimum 6 million b/d of oil from the Gulf through the Strait of Hormuz, making it still the most important oil transport route in the non-Communist world. 25X1 25X1

Appendix A

Iraq's Export Pipelines

Iraq-Syria-Lebanon

The Middle East's first crude oil export pipelines opened in 1934, linking Iraq's northern oilfields to ports in the eastern Mediterranean. The two 12-inch-diameter lines had a capacity of 45,000 b/d each. A northern line crossed Syria and terminated at the Lebanese port of Tripoli, while the southern line passed through Jordan and Palestine to an export terminal at Haifa. This latter pipeline operated from 1934 until 1948, when it was permanently closed after the formation of the state of Israel. Portions of the line in Jordan are still in use distributing irrigation water and some petroleum products throughout the country.

Expanding oil production from Iraq's Kirkuk Oilfield and loss of the southern 12-inch line spurred construction of a second northern pipeline. In addition to a parallel 16-inch line, new and more powerful pumps were installed at each of the seven pumping stations. When modifications were completed in 1949, the line's capacity was boosted to about 150,000 b/d.

This expansion was already inadequate when completed. Construction of a third pipeline, 30 to 32 inches in diameter, was completed in 1952, boosting capacity to 500,000 b/d and adding a second export terminal at Baniyas, Syria. The system was closed by sabotage during the Suez Canal crisis in 1956; plans for a further capacity increase were initiated when it was reopened in 1957.

By altering pumping arrangements and laying parallel "loops" of pipe in areas with greater-than-normal uphill grades, an extra 250,000 b/d of capacity was added over the next three years. By 1961 the individual "loops" had been connected, creating a second parallel 32-inch pipeline. A second set of pumps was provided at each station to service the new large-diameter line, and capacity reached 1.2 million b/d. As the system now exists, the 30- to 32-inch pipelines run to Baniyas, while a 30-inch-diameter section parallels the 12- and 16-inch lines to Tripoli.

The Tripoli export terminal has three deepwater loading buoys able to handle tankers up to 300,000 dwt, and a smaller berth closer to shore. Gravity flow provides oil to the berths by way of submarine pipelines from 15 storage tanks with a total capacity of 1.4 million barrels. The port's nominal throughput rate is 645,000 b/d. At Baniyas, shallow water allows accommodation of tankers only up to 120,000 dwt, although the terminal has a nominal throughput capacity of 830,000 b/d. Because of low-lying terrain, the oil must be pumped through submarine lines to the four offshore loading buoys. The 28 storage tanks at Baniyas have a total capacity of 5.6 million barrels.

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Through 1980 the export capacity of Baniyas was limited to 400,000 b/d because one of the loading berths had been reconfigured to import gas-oil for domestic use. Expansion of the Baniyas refinery was to have eliminated this restriction, although it is currently not known if the port is capable of exporting at its rated capacity. Use of several of the crude oil storage tanks to hold petroleum products for the refinery, however, could still hamper full-scale export operations at the oil terminal.

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The Turkish Pipeline

Currently, the sole operating Iraqi oil export route is the 981-km-long pipeline running from the Kirkuk Oilfield in Iraq to the Turkish Mediterranean port of Ceyhan. The 40-inch-diameter pipeline has five pumping stations, three of which are in Turkey. One of two main control centers for the line is located at Ceyhan, while the other is at the initial pump station in Iraq. The line opened in 1977 and is currently capable of carrying 700,000 b/d.

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Storage at the export terminal consists of seven 1-million-barrel storage tanks gravity feeding four tanker berths at the end of a 2-km-long jetty. The port can handle tankers up to 300,000 dwt.

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The capacity of the pipeline is currently being expanded to 980,000 b/d. The $100-140 million project will replace all pumps at existing stations and add five new pumping stations—two in Iraq and three in Turkey. Also, 75 km of new pipe "looping" the line in critical areas will be added. Construction is to be completed in mid-1984. In the meantime, injection of chemicals to enhance flow reportedly should be able to increase current flow rates by as much as 130,000 b/d. 25X1

The "Strategic" North-South Pipeline

Addition of the North-South Pipeline between the Iraq-Syria Pipeline system at Al Hadithah (pump station K-3) and the southern oilfield at Rumaila significantly increased the flexibility of the Iraqi oil export network. The three pumping stations along the 42-inch diameter line allow movement of 980,000 b/d of crude oil to the south, or 880,000 b/d northward. The southern end links with the Rumaila-Fao Pipeline leading to the Persian Gulf offshore loading terminals. After both sea islands were destroyed at the beginning of the Iran-Iraq war, the North-South Pipeline allowed Iraq to produce and export up to 700,000 b/d of crude through Syria from Iraq's southern oilfields. Closure of the Syrian Pipeline by Damascus in April 1982 terminated crude oil exports from Iraq's southern fields. The 42-inch crude oil pipeline is paralleled by an 18-inch natural gasline. 25X1

Appendix B

Saudi Arabia's Export Pipelines

The Trans-Arabian Pipeline (Tapline)

When finished in 1950, Tapline was one of the world's first large-diameter, long-distance pipelines. At 1,213 km, it is still the longest line in the Middle East. The 30- to 31-inch diameter line has a nominal capacity of 500,000 b/d and is driven by eight pumping stations, seven in Saudi territory and one in Jordan. Tapline supplies crude oil feedstock for Jordan's Zarqa Refinery and the Medreco Refinery adjacent to the pipeline's export terminal at Sidon, Lebanon. This facility has storage for 4.1 million barrels of crude oil in 23 tanks. Crude flows by gravity through submarine pipelines to three offshore tanker berths.

Use of Tapline as a major export route ended in 1975, when transportation economics began to favor supertankers operating from the Persian Gulf. The line remained partially open, however, to support the two refineries, carrying 50,000 to 100,000 b/d annually. In the years since Tapline has been closed for exports,

cannibalization of equipment needed to keep the line operating may have cut its effective operating capacity in half.

Since 1981 military action in Lebanon has damaged the pipeline, the storage tank farm, and the Medreco Refinery. The impact of the damage on the line's export capacity is not known, although the refinery is once again operating, and Tapline's terminal and tank farm are being used to import and store crude oil feedstock. However, the Trans-Arabian Pipe Line Company—still wholly owned by the four Aramco partners (Exxon, Texaco, Chevron, and Mobil)—has recently announced its intent to abandon the Lebanese portion of the pipeline. It apparently will continue supplying Jordan with about 50,000 b/d. With no commitment to repair the damage in Lebanon, and with only a modest operating and maintenance budget, Tapline's use as an export route from the Persian Gulf is apparently over.

Petroline—The East-West Pipeline

Concern about the vulnerability of its Persian Gulf export facilities in the mid-1970s led Riyadh to construct Petroline, the 1,200-km-long East-West Pipeline to the Red Sea port of Yanbu al Bahr. Completed in 1981 at a cost of $1.6 billion, the 48-inch-diameter pipeline has a capacity of 1.85 million b/d. The crude oil line is paralleled by a 26- to 30-inch-diameter natural gas liquids (NGL) pipeline with a capacity of 270,000 b/d. This line fuels the 11 pumping stations and also feeds an NGL-fractionation plant in Yanbu al Bahr. In an emergency, the pump stations are also capable of using crude oil from the main line. 25X1 25X1

The deepwater export terminal at Yanbu al Bahr consists of a three-berth pier that can handle tankers up to 500,000 dwt and a tank farm with 11 million barrels of storage. In addition, the port's NGL plant is capable of producing 250,000 b/d of liquefied petroleum gas (LPG) and natural gasoline for export. Two refineries are also under construction; a 170,000-b/d refinery for the domestic market nearing completion and a 250,000-b/d export refinery scheduled to be finished in 1984. The refineries are to be served by a separate loading pier capable of handling product tankers up to 150,000 dwt. 25X1 25X1 25X1

Expansion of Petroline has been discussed but does not appear imminent in view of cutbacks in Aramco's capital investment budget. As currently configured, the line's 1.85-million-b/d capacity is achieved by using two of the three pumps at each of the 11 pumping stations. The pipeline should be capable of pumping 2.35 million b/d using all three pumps at each station but has never been tested at this rate.

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Petroline has been tested to 1.9 million b/d with no problems. With the addition of one pumping station and parallel 48-inch "loop" lines in sections with severe grades, nominal capacity could be raised by 500,000 b/d. At an estimated cost of $1 billion, however, this is not an attractive option at present. Plans for a second crude oil line were included in the initial construction, and a parallel trench for the future line was dug in those areas that required extensive excavation or blasting through bedrock.

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Appendix C

Other Pipeline Proposals

The Iraq–Saudi Arabia Line

Baghdad is intensely interested in constructing a pipeline through Saudi Arabia; US Embassy reporting from Baghdad indicates that the pipeline was one of the primary issues raised in recent talks with Riyadh. King Fahd is reported to have agreed to the project, and Iraq has publicly announced its intention to begin work soon. Financial considerations, however, could prevent an early start. Given the length of time needed for engineering and route development and construction, it is unlikely that the line could be finished before 1987 at the earliest, even if the project is initiated soon.

The preliminary feasibility study completed in 1981 concluded that a 48-inch-diameter pipeline carrying 1.6 million b/d could be constructed in four and a half years, at a cost of $3.6 billion. Of the four alternate routes studied, the most financially attractive one runs southwesterly across Saudi Arabia, joining the Petroline right-of-way to cross the mountains in the western section of the country. The pipeline would be 1,240-km long, with 10 pumping stations, and would end at a new export terminal on the Red Sea approximately 25 km south of Yanbu al Bahr.

The "Trans-Oman" Pipelines

Recent conversations within the Gulf Cooperation Council concerning a 1-million-b/d pipeline appear to have been initiated by Muscat and have attracted little enthusiasm from other members. The Japanese are reported to have done a preliminary study in 1977, and Aramco was tasked to prepare an economic assessment in 1981. Nothing apparently has come of either effort

Separately, Aramco is in the midst of exploration and delineation drilling in the Shaybah and Ramlah Oilfields in southeastern Saudi Arabia, which could be tied into a pipeline to Oman. In the absence of development, however, Riyadh is unlikely to participate in a pipeline to Oman strictly on security grounds.

Lingering animosity between the UAE and Oman makes the Emirates unenthusiastic about a joint pipeline. The UAE has, however, expressed interest in building its own line to the Gulf of Oman entirely within UAE territory. In 1981 a feasibility study reportedly was initiated on a 48-inch-diameter, 1.6-million-b/d-capacity pipeline running from Abu Dhabi to the Emirate of Fujairah, which lies on the Gulf of Oman outside the Strait of Hormuz. The cost was estimated at approximately $1 billion, and only one year would be needed for constructing the 300-km line. There has been no recent reporting on the scheme, and—in view of the current soft oil market—it is unlikely to be resurrected soon.

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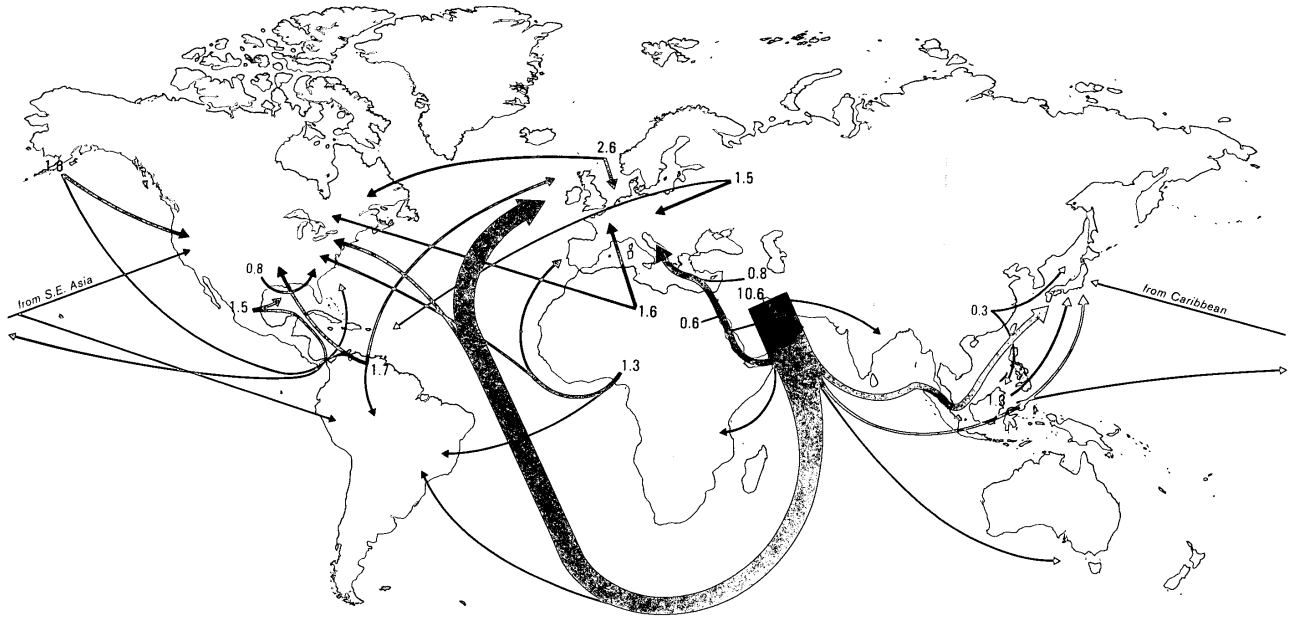
Main Oil Movement by Sea—1982[a]



1.2 Number indicates oil supply (million b/d) at point of origin.

25X1

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[a] First-half 1982 data.